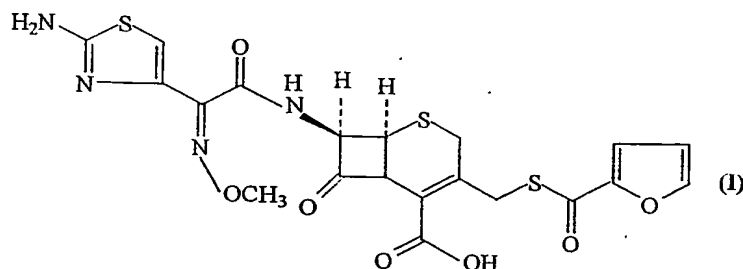
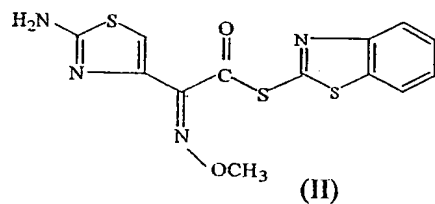


We claim

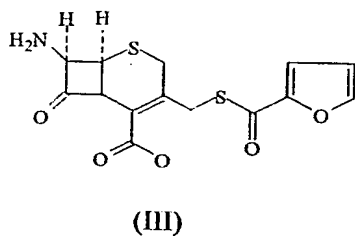
1. A process for preparation of ceftiofur of formula (I) of high purity and substantially free from impurities comprising,



reacting [2-(2-aminothiazol-4-yl)]-2-syn-methoxyimino acetic acid-2-benzothiazolyl thioester of formula (II),



- 10 with 7-amino-3-(2-furanylcarbonylthiomethyl)-3-cephem-4-carboxylic acid of formula (III)

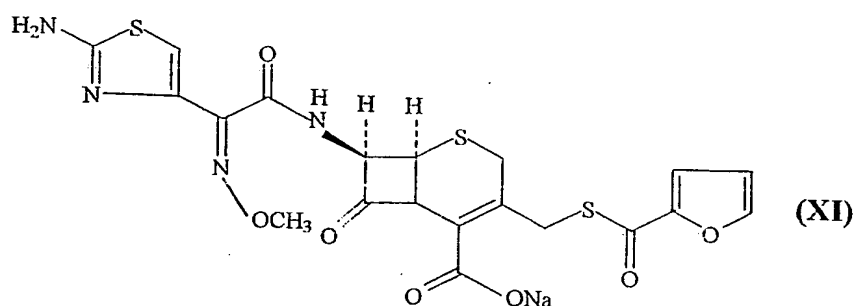


- in the presence of a mixture of an water-immiscible inert organic solvent and water and in the presence of a organic base and isolating ceftiofur of formula (I) substantially free of impurities by,

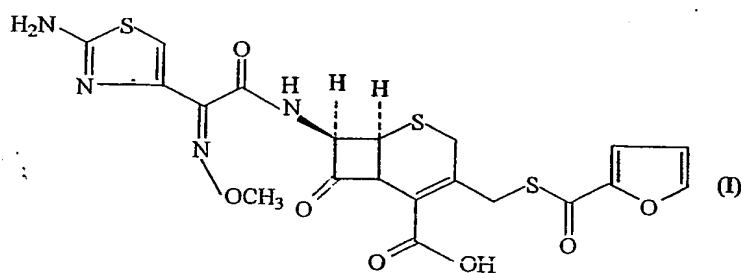
a) adding water to the reaction mixture and selectively partitioning the impurities in the organic phase and ceftiofur (I) in the form of a salt with the base in the aqueous phase,

- b) acidifying the aqueous phase containing ceftiofur (I) in the form of a salt with the base in the presence of a mixture containing a water-miscible and a water-immiscible organic solvent and in the presence of a saturated aqueous solution of an alkali or alkaline earth containing salt, to partition ceftiofur (I) in the organic phase, and
- 5 c) isolating ceftiofur (I) of high purity and substantially free of impurities by evaporation of the organic solvent or precipitation by addition of a co-solvent.
2. A process according to claim 1, wherein the water-immiscible inert organic solvent comprises a chlorinated solvent.
3. A process according to claim 2, wherein said chlorinated solvent is selected from
10 dichloromethane, 1,2-dichloroethane, and chloroform.
4. A process according to any preceding claim wherein the organic base is selected from triethyl amine, N-methyl morpholine, tert-butyl amine, dicyclohexyl amine, tri-n-butylamine, N-methyl pyrrolidinone and 2,3-dimethylamino pyridine.
5. A process according to claim 3 or 4, wherein the base is employed in molar
15 proportion of 1.0 to 3.0 moles per mole of the compound of formula (III).
6. A process according to any preceding claim, wherein the compound of formula (II) is employed in molar proportion of 1.0 to 2.0 moles per mole of the compound of formula (III).
7. A process according to any preceding claim, wherein the ratio of the water-immiscible inert organic solvent and water is between 90: 10 and 98: 2.0.
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8. A process according to claim 7, wherein the ratio of the water-immiscible inert organic solvent and water is preferably between 95: 5.0 and 97.5: 2.5.
9. A process according to any preceding claim, wherein the temperature at which the reaction is carried out is between 0 and 30°C.
- 25 10. A process according to any preceding claim,, wherein the water-immiscible solvent is a chlorinated solvent or C₁₋₆ alkyl acetate.
11. A process according to claim 10, wherein the chlorinated inert organic solvent is selected from dichloromethane, dichloroethane and chloroform and the C₁₋₆ alkyl acetate is selected from ethyl acetate, butyl acetate, n-propyl acetate, isopropyl acetate and tert-
30 butyl acetate.

12. A process according to any preceding claim, wherein the acid employed for adjusting the pH is a mineral acid selected from orthophosphoric acid, hydrochloric acid and, sulphuric acid.
13. A process according to any preceding claim,, wherein the pH of the reaction in
5 step (b) is 3.0 ± 0.1 .
14. A process according any preceding claim, wherein the water-miscible organic solvent is selected from a ketonic solvent and a nitrile.
15. A process according to claim 14, wherein the water-miscible organic solvent is a nitrile selected from acetonitrile, propionitrile and butyronitrile.
- 10 17. A process according to any preceding claim, wherein the water immiscible solvent is selected from chlorinated solvents like dichloromethane, dichloroethane, chloroform or C₁₋₆ alkyl acetates like ethyl acetate, n-butyl acetate, and isopropyl acetate..
16. A process any preceding claim, , wherein the alkali or an alkaline earth metal containing salt is selected from sodium chloride, potassium chloride, sodium sulphate, potassium sulphate, calcium chloride.
- 15 17. A process according to any preceding claim, wherein the co-solvent is selected from an aromatic hydrocarbon and an aliphatic hydrocarbon.
18. A process according to claim 17, wherein the aromatic hydrocarbon is selected from toluene and, xylene and the aliphatic hydrocarbon is selected from cyclohexane, n-
20 hexane and heptane.
19. A process for making the ceftiofur sodium of formula (XI) of high purity, stability and substantially free from impurities, comprising,



reacting ceftiofur of formula ((I),



with sodium-2-ethyl hexanoate in an aqueous mixture of water miscible organic solvents
and in the presence of an organic base.

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